



CASE REPORT

Endodontic Management of a Fused Maxillary Permanent Lateral Incisor with a Supplemental Lateral Incisor

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ABSTRACT: Fusion and gemination are two distinct developmental anomalies whose differentiation is often difficult, more so, when a fusion occurs between a permanent and supernumerary teeth. This case report discusses in detail the endodontic management of a fused permanent maxillary lateral incisor and its supplemental supernumerary tooth in a 16 year old female patient.

Key words: Fusion, Gemination, Supplemental, Supernumerary

Fusion of teeth can be defined as a developmental anomaly characterized by the union of two adjacent developing teeth, which could be either partially or totally fused depending on the stage of development.

Although the exact cause of fusion is still obscure, the influence of pressure and physical forces that produce intimate contact between two developing teeth, has been believed to be one of the most probable reasons.^[1] Lowell and Soloman^[2] suggested that the close approximation between two tooth germs leads to necrosis of the intervening tissue allowing the enamel organ and dental papillae to unite which results in fusion. Further, Grover and Lorton^[3] claim that local metabolic interferences, which occur during morphodifferentiation of the tooth germ, may be the cause.

Gemination, on the other hand, is a similar dental anomaly that is defined as an attempt of a tooth bud to divide. Such a division is often incomplete and results in a single root with one canal but two completely or incompletely separated crowns.^[4,5]

Although fusion and gemination are two distinct entities, the differentiation between them is often difficult, especially when fusion occurs between a normal and a supernumerary tooth. The supplemental tooth, a type of supernumerary, refers to a duplication of teeth in the normal series and the most common supplemental tooth is the permanent maxillary lateral incisor.^[1]

This case report highlights the endodontic management of fusion between permanent maxillary lateral incisor and its supplemental tooth.



Fig.1: Pre-operative labial view of a fused right permanent maxillary lateral incisor with a supplemental supernumerary lateral.



Fig.2: Pre-operative palatal view shows separate cingulum in the fused teeth.

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CASE REPORT

A 16 year old female patient reported to the Department of Conservative Dentistry, Sri Balaji Dental College and Hospital, Chennai, with the complaint of pain in the right maxillary anterior teeth region. Elaborating the history of presenting illness, pain was continuous in nature and radiated to the right half of the face, which subsides on medication. Her medical history was noncontributory.

On intraoral clinical examination, the right permanent maxillary lateral incisor (tooth #12) was fused with a supplemental lateral incisor and the fusion was well delineated by labial, incisal and palatal grooves (Fig-1). Palatal examination revealed two separate cingulums in the crowns of the teeth fused (Fig-2). Full complement of teeth was present with no history of previous extractions.

Thermal and electrical pulp tests of both, tooth # 12 and supernumerary displayed a delayed response. Radiographically, the line of fusion was continuous from the crown to the apex, except in the middle third of the root, with diffuse radiolucency evident in relation to the apex of both the teeth (Fig-3).

Following isolation under rubber dam, lingual access was established into each pulp chamber separately. The working length radiograph demonstrated the presence of two separate canals which were fused in the apical third (Fig-4). Cleaning and shaping was accomplished using hand instruments and calcium hydroxide intracanal medicament placed for one week. Obturation was completed (Fig-5) and the access cavity was sealed separately for both the teeth with a hybrid light cure composite. The palatal grooves were sealed by preventive resin restoration technique.

DISCUSSION

Clinically it is often difficult, if not impossible, to differentiate between fusion and gemination, especially when a supernumerary tooth is fused with a permanent tooth.^[6] However, the treatment protocol for either of these anomalies does not differ to a large extent. Mader et al^[7] has discussed the difficulty in differentiating fusion and gemination in the adult dentition. He suggested that all succedaneous teeth that are joined or fused by dentin be referred to as fused teeth. Fusion of permanent and supernumerary teeth occurs less frequently than fusion between permanent teeth.

Hachisuka^[8] reported that the frequency of fusion



Fig.3: Pre-operative radiograph exhibiting line of fusion from crown to root.



Fig.4: Working length radiograph demonstrating two separate canals fused in the apical third.



Fig.5: Post-operative radiograph following obturation.

between permanent and supernumerary teeth is 0.1% and this type of fusion usually involves the maxillary anterior teeth. The labiopalatal grooves that delineate the fused teeth by a line of fusion could have had some undetected communication between the pulp cavity and the oral environment that resulted in necrosis of the pulp with subsequent periapical inflammation. Balney TD et al^[9] reported a similar case of fusion showing total necrosis of the pulp with a wide-open apex in the absence of caries and periodontal disease. Endodontic treatment was initiated in both the teeth independently and the patency filing demonstrated the presence of two separate canals, which were fused in the apical third. After completion of endodontic therapy the access cavity was sealed with a hybrid light cure composite resin and the lingual grooves were restored by preventive resin restoration technique, in order to eliminate the susceptible grooves.

Literature studies suggested different multidisciplinary approach in the therapy of fused incisors, which depends on the configuration and number of the pulp chambers and canals.^[10] In the case where the pulp chambers and canals are separated, some authors propose separation and extraction of anomalous tooth with orthodontic closing of the space and reshaping of the teeth.^[11] Others propose surgical separation with restoration of both teeth.^[12,13] The third possibility stated in the literature is selective grinding of the fused teeth so that the width of the crown is reduced.^[14]

CONCLUSION

In the present case, as esthetics was not an immediate demand by the patient, the fused teeth were root treated and restored, which was however a prerequisite for esthetic rehabilitation in the future.

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